PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P05135300	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/JP2005/002966	International filing date *(day/month/year)* 17.02.2005	Priority date *(day/month/year)* 17.02.2004
International Patent Classification (IPC) or national classification and IPC F01L13/00		
Applicant HONDA MOTOR CO., LTD. et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ *sent to the applicant and to the International Bureau)* a total of sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
16.09.2005	17.01.2006
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Paquay, J Telephone No. +31 70 340-

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2005/002966

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-69	as originally filed

Claims, Numbers

1-4	as originally filed

Drawings, Sheets

1/9-9/9	as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-4
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-4
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-4
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item V.
Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:
D1 : PATENT ABSTRACTS OF JAPAN vol. 2002, no. 12, 12 December 2002 (2002-12-12) &; JP 2002 235515 A (SUZUKI MOTOR CORP), 23 August 2002 (2002-08-23)

2.1 Document D1, which is considered to represent the most relevant state of the art, discloses (*the references in parentheses applying to this document*) A valve train for an internal combustion engine, comprising a valve operating cam (*14a*) rotating around a rotational centre line in synchronism with a rotation of an engine; an engine valve inlet valve (*10*); a transmission mechanism (*rocker arm 12, swinging arm 32*) for transmitting a valve drive force of the valve operating cam (*14a*) to the engine valve (*10*) so as to operate the engine valve in open and close states, the transmission mechanism including;

- a primary oscillating member (*rocker arm 12*) oscillating about a primary oscillating centre line;
- a secondary oscillating member (*swinging arm 32*) oscillating about a secondary oscillating centre line through abutment with the primary oscillating member so as to transmit the valve drive force via the primary oscillating member (*rocker arm 12*) to the engine valve (*10*),
- a holder (*slide guide 42*) supporting the secondary oscillating member thereon in an oscillatory fashion (*oscillating around pin 36 of slide guide 42*) and wherein a drive abutment portion of the primary oscillating member (*rocker arm 12*) abuts with a follower abutment portion of the secondary oscillating portion;
- a driving mechanism (control cam 34) for driving the holder (*slide guide 42*) so as to control valve properties including opening and closing timings and maximum lift amount of the engine valve in accordance with a position of the holder which is driven by the driving mechanism (*control cam 34*), wherein the holder (*slide guide 42*) oscillates about a holder oscillating centre line (*centre of shaft 34b*) which differs from the rotational centre of the valve operating cam (*14a*) in response to the operation of the driving mechanism and

- a cam profile having a lost motion profile for maintaining the engine valve in the closed state (*paragraph [0001] of document D1 mentions zero lift possibilities, thus the cams must have a lost motion profile*).

From this, the subject-matter of independent claim 1 differs in that in document D1:

- the holder only supports the secondary oscillating cam (instead of the first and second oscillating cam, as claimed),
- the primary and secondary oscillating centre lines do not oscillate together with the holder, and
- the aspect of the cam abutment position that approaches a specific line (
("*.....wherein*
as the oscillating position of the holder approaches a predetermined position where a valve operating property where a maximum lift amount becomes maximum is obtained,
a cam abutment position
where a cam lobe portion of the valve operating cam and the cam abutment portion abut with each other
approaches a specific straight line which passes through the holder oscillating centre line and the rotational centre line")
is also missing.

In view of these differences, the subject-matter of the first and only independent claim 1 is therefore novel (Article 33(2) PCT).

The implementation of a holder that supports both the primary and secondary oscillating centres would lead to a strong modification of the cylinder head because the whole idea of the arm linked around the adjustable shaft 52, the rocker arm 12 and the swinging arm 32 has to be modified. In view of this and in view of the amount of constructional modifications, the subject-matter of the first claim can be considered as inventive (Article 33(3) PCT).

2.2 Claims 2-4 are dependent on claim 1 and as such also meet the requirements of the

PCT with respect to novelty and inventive step.

Re Item VII

Certain defects in the international application

1 Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D1 and D2) being placed in the preamble (Rule 6.3(b)(I) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).